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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,972	09/30/2003	Ali A. Said	30256/39669	7676

4743 7590 08/10/2006

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EXAMINER

ANGEBRANDT, MARTIN J

ART UNIT PAPER NUMBER

1756

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/676,972	SAID ET AL.	
	Examiner	Art Unit	
	Martin J. Angebrannt	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 0305 and 07 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 17-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-51 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>57704</u> 5-17-04 | 6) <input type="checkbox"/> Other: _____ |

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1. The restriction requirement of 7/1/2005 is incorporated by reference to that action here without repeating it. The applicant's response of 8/3/2005 has been received and made of record.
2. Applicant's election with traverse of group I, species A (claims 1-16 and new claim 51) in the reply filed on 8/3/2006 is acknowledged. The traversal is on the ground(s) that there is no serious burden on the examiner. This is not found persuasive because the resulting waveguides may be very different in physical and optical properties and the treatments are different and would require searching in different areas and using different strategies. In particular the limitation of the elected species relating to the propagation characteristics requires an the first pass of the beam to form an area which can not propagate a particular laser wavelength due the width being in appropriate

The requirement is still deemed proper and is therefore made FINAL.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1,2,4-12,15-16 and 51 are rejected under 35 U.S.C. 102(e) as being fully anticipated by Borrelli et al. '452.

Borrelli et al. '452 teach with respect to figure 2, seven serial passes of the laser beam, which results in a larger cross sectional area for the waveguide and is exemplified in example A where a spacing of 0.5 micron is taught [0039-0043,0056-0058]]. The use of the same technique to form waveguides with elliptical cross-sections is disclosed. [0044]. The use of a helical motion is disclosed and exemplified in example B the spot size was 2 microns and a 3.5 micron by 6.5 microns waveguide was formed [0048-0051,0059-0060]. The use of a plurality of beams to simultaneously form the desired multiple beams and the scanning of these together is disclosed. (figure 10 and [0052]) The modification of translation rate, spot focus size, repetition rate, pulse energy, wavelength, focusing and offset can be varied and the formation of tapered features is disclosed [0041,0045,0049,0054].

No polarization means is disclosed, so the beam is considered unpolarized.

6. Claims 1,2,4-16 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borrelli et al. '452, in view of Hirao et al. "Writing waveguides and gratings in silica and related materials by a femtosecond laser", J. Noncryst. Sol. Vol. 239 pp. 91-95 (1998).

Hirao et al. "Writing waveguides and gratings in silica and related materials by a femtosecond laser", J. Noncryst. Sol. Vol. 239 pp. 91-95 (1998) teaches the rescanning over the same path for 10 passes (scanning number :10 in figure 3 (see page 92,right column).

It would have been obvious to one skilled in the art to modify the process taught by Borrelli et al. '452 by scanning some of the paths more than once, based upon the direction relating to the varying the offset and based upon the disclosed that this is known within the fs

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laser waveguide formation art as disclosed by Hirao et al. "Writing waveguides and gratings in silica and related materials by a femtosecond laser", J. Noncryst. Sol. Vol. 239 pp. 91-95 (1998), who exemplifies 10 overscans.

7. Claims 1-16 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borrelli et al. '452, in view of Hirao et al. "Writing waveguides and gratings in silica and related materials by a femtosecond laser", J. Noncryst. Sol. Vol. 239 pp. 91-95 (1998) and Ngoi et al. '781.

Ngoi et al. '781 teach laser processing using laser pulses, which are in the fs to ms regime and in the 100-150 nm wavelength range (2/27-39). The use of the S or P polarization or depolarized/randomly polarized for straight lines is disclosed. The polarization is disclosed as affecting the efficiency of the cutting (12/18-59).

It would have been obvious to one skilled in the art to modify the process resulting from the combination of Borrelli et al. '452 and Hirao et al. "Writing waveguides and gratings in silica and related materials by a femtosecond laser", J. Noncryst. Sol. Vol. 239 pp. 91-95 (1998) by using a linearly polarized beam or a depolarized beam as taught by Ngoi et al. '781 with the choice being based upon the efficiency and uniformity of the refractive index changes.

8. Claims 1,4-7,11-16 and 51 are rejected under 35 U.S.C. 102(e) as being fully anticipated by Dugan et al. '877.

Dugan et al. '877 teach the use of multiple scans which are either atop one another or beside each other. The formation of an oval waveguide, the formation of DFB regions and the variation of the intensity and focal spot size are disclosed. (5/1-53).

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9. Claims 1,2,4-16 and 51 are rejected under 35 U.S.C. 102(e) as being fully anticipated by Dugan et al. '850.

Dugan et al. '850 disclose an invention similar to that claimed where ultrashort laser pulses are used to form waveguides. These include lasers with pulse widths of less than 100 fs and powers in the nJ or microJoule range. (5/17-30). The use of these techniques in trimming by exposure either within or adjacent to waveguides and in either transverse or axial directions and the use of an unpolarized beam is disclosed. (5/31-51). The pulses are preferably at a wavelength at which the material is transparent (6/18-43) and multiphoton is disclosed as causing the changes in the absorption profile. (7/1-25). The movement of the confocal volume of the beams during exposure either axially or longitudinally to expose the desired volume using translational stages, shifting of the focus and computer control is disclosed (7/43-8/40). The use of translation of the beams to form transitions between circular and square waveguiding portion is disclosed. (16/8-22). The repeated scanning of areas is taught throughout (see eg 18/62-19/28)

10. Claims 1-16 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dugan et al. '850, in view of Ngoi et al. '781.

It would have been obvious to one skilled in the art to modify the process resulting from the combination of Dugan et al. '850 by using a linearly polarized beam, taught by Ngoi et al. '781 as equivalent or preferable based upon the desired profile with the choice being based upon the efficiency and uniformity of the refractive index changes.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Stuart et al. WO 99/55487 teaches polarization effects in laser machining.

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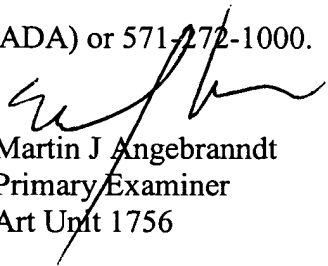
Borrelli et al. WO 01/09899 teach direct laser writing using fs pulses.

Davis et al., 'Writing waveguides in glass with a femtosecond laser, Opt. Lett., Vol. 21(21) pp. 1729-1731 (11/1996) teaches 10 passes of the laser over the same path. (page 1730, left column first full paragraph)

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebrannt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Martin J Angebrannt
Primary Examiner
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08/4/2006